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Conservation
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Soil & Water Conservation News

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3	Comments From the Chief
4	Conservation Education
11	News Briefs
14	Management Tips
14	RCA Update
16	Meetings

SNOTEL Returns to Mount Saint Helens

by Robert T. Davis

Immediately after USDA's Forest Service gave the Soil Conservation Service approval to install SNOTEL sites in the Mount Saint Helens area, we felt a sense of urgency. As State Snow Survey Supervisor with SCS in Washington, I was responsible for installing three new SNOTEL sites at Marble Mountain, Ryan Lake, and Sheep Canyon, and replacing the one at the Plains of Abraham destroyed by the May 18 eruption of Mount Saint Helens.

SNOTEL (SNOWpack TELEmetry) uses remote sensor devices to collect snow, precipitation, and temperature data and transmits the data through a unique meteor burst system to receiving stations in SCS offices.

The whole character of the watershed had been changed by the eruption. This caused a need for more

Continued on next page



Snow survey crew guides airlifted instrument shelter to its foundation at the Plains of Abraham SNOTEL site. Deep gullies on Mount Saint Helens, 2 miles away in the background, were cut by mud flows that covered the Plains of Abraham with several feet of ash and pumice.

Photo by John Massey, visual information specialist, West Technical Service Center, SCS, Portland, Oreg.

It's AgRISTARS!

by Ted Kupelian

AgRISTARS—it sounds like the title of a science fiction movie, but it stands for Agriculture and Resources Inventory Surveys Through Aerospace and Remote Sensing. It is a 6-year, \$300 million project designed to gain timely information about the Earth through remote sensing by satellite and special technology on the ground.

AgRISTARS will attempt to determine crop condition changes; forecast crop production; inventory and assess land, water, and related resources; and determine the cost effectiveness of airborne data collection methods.

The U.S. Department of Agriculture's Soil Conservation Service, Forest Service, Science and Education Administration, and Economics and Statistics Service along with the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the U.S. Department of the Interior, and the Agency for International De-

velopment are cooperating on the project.

"This joint program of research, development, test, evaluation, and application of remote sensing technology is specifically designed in response to USDA's requirements for more reliable, timely, and objective information in monitoring and managing Earth resources," says Richard Gilbert, SCS project manager.

The eight major projects under AgRISTARS are the early warning/crop condition assessment; foreign commodity production forecasting; yield model development; supporting re-

Continued on next page.

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SNOTEL Returns, cont.

SNOTEL sites around the mountain and a need to take more frequent data readings. Data collected over a period of years will help us determine long-term runoff effects of ash on the snowpack and of snowpack on the ash.

As we went into the area to install the sites, we knew we needed good weather, a quiet mountain, and enough of the right people to help. The whole operation depended on the successful airlifting of materials and people, and we were thankful that the Forest Service arranged for us to use their helicopter.

Members of the SCS team that joined me were from snow survey staffs in Wyoming, Oregon, Nevada, and the West Technical Service Center (TSC) in Portland, Oreg. Pacific Power and Light gave us a lot of support. They built the shelterhouses, and two or three of their crew worked alongside us all the way. They added their weight to the ropes that brought the helicopter loads into position, and helped with digging trenches, working with cement, or

whatever was needed. They even helped assemble gear at the Swift Reservoir staging area.

Besides the Forest Service helicopter with its carrying capacity of 3,000 pounds, we rented a small private helicopter capable of lifting 1,500 pounds. These two helicopters made trip after trip with cargoes in their slings—construction materials, snow pillows, shelterhouses, and the 26-foot-high precipitation gages.

The crew worked long, hard hours in its race against expected weather changes, always aware of the threatening volcano. The initial phase of the work was completed in mid-October, only a few days before Mount Saint Helens turned loose with three more major eruptions. By late November, crews were taken to the four sites, and electronic communications gear was installed and operating. With the added sites, SCS now has eight SNOTEL locations providing reports on and near Mount Saint Helens.

We expect to add a microprocessor to each of these eight SNOTEL sites. These small computers will send

alarm messages to two central locations—one at the West TSC and the other at the SCS Washington State office in Spokane. Messages will indicate when an extreme change has taken place—unusual amounts of precipitation, melting of snow, or temperature changes—the kind of information needed immediately by river forecasters of the National Weather Service, the U.S. Army Corps of Engineers, and others who make vital decisions about river management and public safety.

We are also making arrangements with a center that works around the clock to have their terminal receive messages after regular work hours.

What has happened on Mount Saint Helens demonstrates the adaptability of SNOTEL. With only slight modifications in the system and no major changes, we've been able very quickly to make a conversion that will let us use the system better and allow us to concentrate on utilizing the data collected.

Robert T. Davis,
State snow survey supervisor,
SCS, Spokane, Wash.

It's AgRISTARS, cont.

search; soil moisture; domestic crops and land cover; renewable resources inventory; and conservation and pollution.

Using satellite imagery, AgRISTARS will provide crop production forecasts and preharvest estimates for wheat, barley, corn, soybeans, and rice in the United States and several foreign countries. More accurate and timely crop information can help farmers make better planting decisions. Farmers could adjust acreage allotted to various crops to reduce expected world shortages or oversupply, and they could predict

more accurately their fertilizer, pesticide, and equipment needs.

The Soil Conservation Service has the leadership role in the soil moisture project. According to Gilbert, "The soil moisture project is a long-range program of basic research. SCS will benefit from this project by being able to see the soil moisture patterns of large areas and, thus, be able to tell whether we are approaching an agricultural problem because of changes in moisture content in the soil. Climate droughts do not always coincide with agricultural droughts. With this technology, we can better manage our resources to

meet the actual needs of the time.

"This is a new application of technology to our old need for information," explained Gilbert.

The soil moisture data will be useful for various agriculture and water resources information needs, such as helping farmers plan irrigation scheduling.

Ted Kupelian,
writer-editor, Information and
Public Affairs, SCS, Washington, D.C.

Bob Bergland
Secretary of Agriculture

Norman A. Berg, Chief
Soil Conservation Service

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Comments: from the SCS Chief

The pictures of Earth our astronauts sent back from Space helped people realize our planet is a life support system with fixed limits of natural resources. This new perspective of the Earth influences land and water use decisions and activities affecting our natural resource base.

We know that laws, research findings, new technologies, or proclamations by public officials alone do not make us a conservation-minded society. The definition of natural resource problems as well as their solutions lies with people; people who must first think in new ways—see things from a broader and longer range perspective as did the astronauts—before they consider changing their behavior.

The Soil Conservation Service continues to support efforts that help children learn about resource and environmental concerns. But the decisions that determine humankind's impact on the landscape's quality are made by adults. Furthermore, the teachers in our schools are adults. An important goal for SCS is to help those adults and others comprehend Earth as a closed ecosystem—a view that is the key to conservation strategies for the Action Eighties.

Teaching and thinking about ecosystems is a complex process because vast amounts of data from diverse sources must be put together and meaningfully related. In its work in environmental education, SCS links hands with others—conservation districts, other natural resource agencies, teachers, and teacher trainers—to help stimulate interest, provide data and interpretations, develop teachable packages, and give personal assistance. Only in this way can soil and water conservation get a seat at the table where decisions are made. And that is the business of all natural resource agencies.

A handwritten signature in black ink that reads "Norm Berg" with a small arrow pointing to the right at the end of the "g".

Articles Sought for New Publication

A new publication dealing with the restoration and management of plant and animal communities is planned for publication by the University of Wisconsin-Madison Arboretum in March 1981.

The publication, to be called *Restoration and Management Notes*, is intended to encourage exchange of up-to-date information between ecologists, land managers, naturalists, landscape architects, administrators of conservation agencies and programs, and others concerned

about or responsible for ecologically sound approaches to the preservation and management of natural areas.

Contributions are invited and may deal with research, field projects, meetings, publications, and other matters related to the active management of the plant and animal communities native to the central and northeastern parts of North America.

For further information, contact Dr. William Jordan, Editor, The University of Wisconsin-Madison Arboretum, 1207 Seminole Highway, Madison, Wis. 53711.

Conservation Tillage Conference To Be Held

The Empire Chapter of the Soil Conservation Society of America will host a Conservation Tillage Conference for the Northeast States, February 19, 1981, at the State Fairgrounds, Syracuse, N.Y. The program will feature equipment and supply displays, farmer presentations, and the latest in tillage research for practical application. For more information, contact Fred Gaffney, plant materials specialist, Soil Conservation Service, 100 S. Clinton Street, Room 771, Syracuse, N.Y. 13260.

Conservation Education

1980 Conservation Education Award Winners

by Charlotte Nichols

The 1980 winners of the National Association of Conservation Districts-Allis-Chalmers Environmental Conservation Education awards have been selected.

The Teacher of the Year is James G. Black, who is an environmental studies teacher for the Huntsville City Schools in Huntsville, Ala. Runner-up is Stephen L. Norris, who teaches at Hamel Elementary School in Hamel, Ill.

The winning conservation district was the Harrison County Soil Conservation District in Indiana, and the runner-up is the Boulder Valley Soil Conservation District in Colorado.

Winning Teachers

Jim Black, Southeastern regional winner sponsored by the Madison County Soil and Water Conservation District, works with classes from all 25 Huntsville elementary schools as well as many secondary classes.

"Environmental education is best achieved," said Black, "through interdisciplinary experiences that demonstrate relationships between the systems of man and nature so that the student is able to understand his or her role as a citizen of Earth."

Teaching students, developing materials for other teachers to use, and instructing teachers on how to teach environmental studies are the main thrusts of his activities.

"Seeing, hearing, feeling, experimenting, hypothesizing, observing, classifying, predicting, and

interpreting—these are the actions that involve students in cause and effect relationships that lead to environmental caring," he observes.

Black conducted a study of his school system's textbooks and, by outlining the topics, competencies, and concepts, discovered a pattern for introducing environmental concepts in each grade and in each subject area, and then reinforcing the topic at a higher level. In one of his projects, "Evolution of a City," students plan their own city and depict it on paper as it develops. They readily see the growth problems and must make their own decisions about land use and other factors that affect the city's development.

Stephen Norris, North Central regional winner, calls his approach to environmental education a "hands-on approach to learning." Norris believes concepts should be introduced early in a student's education.

"As the students progress through the grades, the basic concepts follow them and become more complex, broadening into adjacent areas of study and requiring them to arrive at solutions to conservation problems," he says.

Through various projects, students at Norris' school measure the effects of erosion; plant and cultivate trees to be used for beautification, wind-breaks, and wildlife habitat; clean up a dumping site; design natural crafts; and go on archeological digs.

Norris believes students have acquired knowledge of a particular concept when they are able to teach that concept to another student. One of his projects consists of sixth grade students teaching kindergarteners how to plant white pine or loblolly pine saplings in the school's nursery.

Norris' nomination was sponsored by the Madison County Soil and

Water Conservation District in Edwardsville, Ill.

Regional Conservation Teacher of the Year winners are: Northeastern region, William E. Brown, Lost Creek, W. Va.; South Central region, Mary Alice Aucoin Fontenot, Ville Platte, La.; Northern Plains region, Ruth Arnott, Brandon, S. Dak.; Southwestern region, Sharon Hackley, Kingman, Ariz; and Pacific region, Patricia Ann Moore, Hillsboro, Oreg.

Winning Districts

Conservation education is flourishing in Harrison County, Ind., thanks to the efforts of the Harrison County Soil and Water Conservation District (SWCD), North Central regional winner. Through its programs and activities, more than 5,000 people have been exposed to conservation tours, special educational programs, and field days this past year.

The district maintains a strong and effective program with assistance from its five-member Education and Youth Committee. The district co-sponsors an annual conservation public speaking contest, holds tours for district officials and families to keep them aware of current countywide conservation work and needs, conducts programs on soil and water conservation and forestry for a Boy Scout camp, and participates in the Governor's Select Committee on Planning with an information program to explain how soils information is used in the county for land use planning and septic system design.

The district pays special attention to Harrison County schools. Early in the fall, the district sends letters to all 325 county teachers which explain services and programs available through the district. A teacher's conference is held to give the teachers an opportunity to consult with district

officials on how they can use the outdoors as an extension of classroom learning. Topics discussed at other district-sponsored teacher/administrator seminars include land use planning, protecting prime farmland, soils and septic systems, and timber resources.

Students at the Crusade School for the handicapped in Palmyra benefited from the district's activities when the district provided technical assistance in planning and developing a nature and physical fitness trail in a 10-acre woods next to the school.

The district feels that its key accomplishment this year has been the formation of a Youth Conservation Board. Since its organization, the Youth Board has put together a 7- by 9-foot composite map of the county's soil survey maps and built an electronic quiz board to match conservation problems with solutions. Both have been used in the district's information booths as a visual educational tool.

For runner-up Boulder Valley Soil Conservation District in Longmont, Colo., long-term district objectives serve as guidelines for developing an active program in conservation education. The objectives are to evaluate the overall environmental education efforts currently underway within the district, inventory the available resources, determine conservation education needs, establish conservation education goals related to local needs, and develop a specific conservation education plan of work.

The district furnishes basic conservation material to schools and teachers, holds a teacher workshop on natural resources conservation, provides a scholarship to the Rocky Mountain Nature Association summer class for an elementary school teacher, conducts conservation tours

for district teachers, and develops teacher packets of conservation bulletins and materials.

Other district activities include conducting a conservation poster contest; sponsoring a boy to the 4-H Conservation Camp and a girl to the Resource Symposium; donating a book on soil and water conservation to a public library; and furnishing speakers and programs on conservation to schools, organized groups, and churches.

The Boulder Valley SCD was the Southwestern regional winner.

Regional conservation district of the year winners are: Northeastern region, Ocean County SCD, Toms River, N.J.; Southeastern region, Overton County SCD, Livingston, Tenn.; South Central region, Pawnee County CD, Pawnee, Okla.; Northern Plains region, Wyandotte County CD, Kansas City, Kans.; and Pacific region, West End Resource Conservation District, Chino, Calif.

Charlotte Nichols,
director of communications,
National Association of Conservation
Districts, Washington, D.C.

Future Farmers Are Protecting the Environment Now

by Glenn F. Graham

Eight members of the Future Farmers of America (FFA) of the Jonesville and Flatwoods High Schools in Lee County, Va., wrote conservation plans for their family farms during the 1979-80 school year. Six more students and their families volunteered to do it again this year.

Involving young people in the planning and application of conservation practices is part of the Daniel Boone Soil and Water Conservation District's youth program. The district reached the students through the vocational agriculture teachers at the two high schools.

In the first year of the project, both the students and their parents signed the cooperator's agreement for the farms. The farms average 80 acres and are mostly in pasture and hayland with small acreages of corn and tobacco. The conservation practices applied include stripcropping, crop rotations, pasture improvement, and brush control.

Soil Conservation Service soil scientists work with the students on mapping the soils on the farms in the fall so that in the winter the students can work with SCS district conservationists and technicians on conservation planning. Conservation practices are applied in the spring.

This hands-on learning experience directly involves the youth in conservation, and it gets parents and their children involved in a worthwhile team project—helping to protect soil and water resources. The project also introduces the students to many different occupations.

The Future Farmers of America in Lee County, Va., are working now to protect the soil and water resources for the future.

Glenn F. Graham,
district conservationist,
SCS, Jonesville, Va.

Teachers Go to School, Too

by Robert L. Gervais

Over the years, many different types of conservation education programs have been attempted to help people develop an awareness of urban sprawl, erosion, and other stresses of our natural resources. Teenagers have gone to summer camp, urban dwellers have taken bus tours to rural areas, and the list could go on.

But in Wyoming, representatives of the State Conservation Commission, the Wyoming Association of Conservation Districts, and the University of Wyoming say that they feel it is much easier to help shape an attitude than it is to change one that is already formed.

Since 1972, the above agencies have been sponsoring a course for classroom teachers on conservation education techniques to guide educators in developing students' attitudes toward conservation.

The selection committee chooses 40 teachers for each session of the course and tries to include at least 20 elementary school teachers in each class. Tuition for the course is about \$50, and the association of conservation districts pays half of each teacher's tuition.

The class is a mixture of class discussions and practical, hands-on experiences. Class discussions include ranch and range resource planning, soil capabilities and limitations, weed and pest control, soil erosion and sedimentation, game and wildlife management, and snow survey and its application.

Class activities include measuring and weighing snow and calculating its moisture content, visiting an over-grazed pasture to see erosion caused

by water and/or wind, and clipping grass and weighing the amount of edible forage available per square foot.

For their final project, the students submit a teaching unit or paper on how they could use information from the course in working with their elementary and secondary school students. The course sponsors compile the assignments into a booklet and send copies to each school in the local school district.

Course instructors include speakers from the Soil Conservation Service and the Wyoming Association of Conservation Districts and farmers, ranchers, and university professors.

In developing and offering a conservation education course for teachers, planners should select an experienced educator as coordinator, allow adequate time for each speaker, and involve students in class discussions and hands-on activities as much as possible.

Robert L. Gervais,
associate professor,
Curriculum and Instruction and
Educational Administration,
University of Wyoming, Casper, Wyo.

Conservation Education All Around

by Garland E. Still, Jr.,
and Frank Jeter, Jr.

Many people in Gaston County, N.C., are working to provide a quality program of environmental education for county students—and succeeding. "Of 58 schools in the Gaston County school system, about half have environmental education programs and the rest are working to develop them," says Glenda Jones, Gaston County Soil and Water Conservation District (SWCD) administrator.

"Environmental education has a high priority in Gaston County schools," says Bruce Trammell, chairman of the Gaston County Board of Education. "Our students are becoming more aware of the problems in the environment and the importance of maintaining the balance of our ecology."

At the Bessemer City Elementary School, which has kindergarteners through third graders, students have their own nature trail. Large wooden cutout animals—a fox, wildcat, squirrel, and raccoon—help the children to understand what they are seeing in nature.

At the New Hope Elementary School, students, teachers, and parents share a project that is educational and edible. The students are growing cabbage, broccoli, eggplant, onions, okra, squash, cucumbers, sweet corn, tomatoes, peas, and bell peppers in a school courtyard. "All the teachers, parents, and students help in some way," says Principal Jake Schrum, leader of the project. "And the children come by every day to see how the garden is doing." The Parent-Teachers' Association helped raise money for the garden project and for a nature trail on the school site.

Seventh graders at William C. Friday Junior High School have built their own 1/4-acre pond with technical assistance from SCS. The students used sand bags to back up the water from a spring to form the shallow pond. The junior high students study microscopic life dipped from the pond they built themselves. They also built a wall across a gully to keep the mud out of the pond. The wall was built in layers of different minerals common to the area such as quartz, granite, and sandstone. The minerals are number-keyed to a nearby sign which

identifies them. SCS also helped design the layout for a nature trail on the school site.

"Enthusiasm is the key to a good conservation education program," says Mary Beam, science teacher at William C. Friday Junior High School, "and seventh graders have a lot of enthusiasm."

The Schiele Museum of Natural History in the county also offers a wide range of educational opportunities to the 720,000 people who visit it each year. The museum has a nature trail on its grounds, and students can study aquatic life in a stream along the trail.

Through the Gaston SWCD, the museum, and agreements with landowners, Gaston County now has more than 7,000 acres of outdoor classrooms. The Soil Conservation Service provides technical data for students to use in planning, evaluating, and using the outdoor classrooms and nature trails.

The Gaston SWCD provides the schools with curriculum resource booklets on 25 subjects with correlating audio-visual programs. The booklets are especially designed for the Gaston County area. For example, the booklet on wildflowers describes only wildflowers that can be found in the local area. The slides showing conservation on the land or erosion that needs to be controlled all portray sites around the county. "The children relate better to slides of hometown places," says Glenda Jones, "and so do the teachers."

The Gaston SWCD is also publishing books of environmental activities designed for each grade level.

Fifty garden clubs in the county rotate the cost of publishing a monthly environmental education newsletter from the SWCD. The newsletter is distributed to teachers

throughout the school system and contains simple outdoor learning activities that teachers can use with their students.

In 1977, the Gaston SWCD won first place in the National Association of Conservation Districts (NACD) and Allis-Chalmers Environmental Conservation Education Awards Program. The district was recognized for its broad-based program that included help with outdoor classrooms for 18 schools, teachers' workshops, and assistance to a variety of youth groups.

In 1979, the Gaston SWCD sponsored the NACD-Allis-Chalmers Conservation Teacher of the Year for the Southeastern region, Ruby Birmingham, a science teacher at Grier Junior High School. "Environmental education helps to develop a positive and caring attitude," says Birmingham. "Outdoor classrooms, nature trails, and field studies are ideal for cultivating this type of attitude and ethics. Environmental education can provide fun, fellowship, and happy learning experiences for students and teachers."

Garland E. Still, Jr.,
district conservationist, SCS,
Dallas, N.C.

Frank Jeter, Jr.,
public information officer,
SCS, Raleigh, N.C.

An Educational View From Horseback

by John Capurro

Learning firsthand about resource conservation and management is the goal of conservation trail rides conducted annually in the Sierra Nevada Mountains. The 2-day event is sponsored by the Carson Valley Conser-

vation District in Nevada, the Alpine Resource Conservation District in California, and the Douglas County Cooperative Extension Service in Nevada. The sixth annual ride, held last September, attracted 45 riders from western Nevada and central California.

Dallas Byington, chairman of the Carson Valley Conservation District, applauds the rides: "The trail rides have provided us an opportunity to educate people about resource conservation. Some of the riders have little idea of how resource management decisions are made."

Specialists from USDA's Soil Conservation Service and Forest Service and the University of Nevada at Reno discuss soil conservation, range management, timber management, and wilderness area management at frequent stops along the trail.

During the last trail ride, a plant species identification contest was held. The plants selected for the contest were pointed out during the day, with explanations of growth characteristics, forage values for all classes of animals, and management considerations.

"The riders were really excited about learning the species names of the plants in the area," said Byington. "Competition was keen for the top awards in the contest."

The trail rides have proven so successful that riders are turned away every year. Applications for the next ride are already being received.

"We're looking forward to next year," said Byington.

John Capurro,
district conservationist and resource
conservation and development coordinator,
SCS, Minden, Nev.

Project Learning Tree: Lessons in Conservation

by Thomas C. Gahm

"Project Learning Tree" provides teachers with dozens of conservation-oriented lesson plans on subjects ranging from "Changing Land Values" to "Did You See That Dogwood Bark?"

During the past year some 500 Minnesota school teachers have sharpened their skills and added to their environmental education teaching material by participating in Project Learning Tree workshops. The 1½-day workshops are sponsored by the Minnesota Department of Education and the American Forestry Institute.

Although the emphasis of Project Learning Tree is on forestry, the lesson plans cover soil, water, land use, and related topics. The program has teaching guides for both elementary and secondary students.

Minnesota's workshops include a thorough hands-on introduction to the Project Learning Tree teaching guides. Also, representatives of conservation agencies and organizations, including SCS, attend to explain the services and educational materials that they have available for teachers.

The workshops offer credit from the State university system for those teachers who follow up with a written report on how they use the Project Learning Tree activities with their students. About 75 percent of the participants have received credit.

"The teachers' evaluations of these workshops have been very favorable," says John Miller, environmental education coordinator with the Department of Education. "The teachers have indicated that the curriculum

material is exactly what they have been looking for to blend in with other environmental education material that has been available. Teachers also like the outdoor emphasis."

Along with the American Forestry Institute, Miller's agency has provided grants to cover workshop expenses and to pay the cost of hiring substitutes for the teachers who attend. Many of the State's 13 regional environmental education councils have also helped sponsor the workshops.

The next step, according to Miller, is to expand Project Learning Tree Workshops to the local school district level. To do that, he and others are asking the State's many forest products companies to provide financial assistance or other help to make it possible for teachers to attend workshops.

Thomas C. Gahm,
public information officer, SCS, St. Paul, Minn.

A Special Camp for Special People

by C. Eugene Mills

On one weekend this past August, about 12 acres in Chelmsford, Mass., was turned into a carefully designed permanent camp site for moderately to severely handicapped and retarded children. The transformation was a cooperative effort among the New England Chapter of the Land Improvement Contractors of America (LICA), the Middlesex Conservation District, and the Soil Conservation Service.

The project began when Camp Paul for Exceptional Children, a non-profit, nonsectarian summer camp, asked the Middlesex Conservation District for assistance in building a wildlife pond. "What has developed

since then is much more than anyone could have imagined," reports Carol LaCanfora, coordinator of the Camp Paul Land Development Committee.

At the same time the camp was looking for help with the pond, the New England Chapter of LICA was looking for an area in Massachusetts where it could hold its annual field day. One day a year, LICA members donate their time and equipment to a project to demonstrate the latest in sophisticated construction equipment and modern, efficient conservation contracting techniques.

LICA, the Middlesex Conservation District, and SCS, working through the district, decided to combine forces on the Camp Paul project. Bob Morehouse, SCS district conservationist, prepared an environmentally sound construction plan and developed detailed engineering designs for the camp facilities. Morehouse had to design the camp facilities to meet the special needs of the handicapped children who would use them.

On Saturday morning, people, equipment, and materials descended on Camp Paul. LICA members from all over New England brought in 15 pieces of heavy equipment ranging from a large bulldozer worth one-quarter of a million dollars to a small bulldozer used for constructing trails.

SCS employees came from as far as 90 miles away to direct the construction activities. The conservation district and Camp Paul volunteers served as tour guides to explain the various construction activities to visitors. Boy Scouts and parents of the children who would use the camp pitched in wherever needed. Morehouse was everywhere that day—directing, coordinating, and explaining the engineering designs.

New England LICA President Peter Whiting and Rhode Island State

Chairman Art LeMonde had arrived several days early to dig a wildlife pond and a small duck pond with their draglines.

By the time the weekend was over, volunteers had completed more than \$75,000 worth of work. They installed more than 1,800 feet of nature trail, with one section especially designed for wheelchairs. Using pre-stressed concrete decking someone had donated, they installed three bridges over a stream on the campsite. The volunteers also installed a water line using plastic pipe someone had donated. They shaped and graded the parking lot and covered it with gravel, installed a diversion to carry runoff to a catch basin and then underground by pipe to the wildlife pond, and built two wooden bridges. The field day volunteers also shaped and graded a large playfield. Four acres of the land grading done that day was done by laser. Finally, the volunteers hydroseeded the newly constructed areas to establish ground cover.

LaCanfora told the volunteers that their work would light up the lives of hundreds of special children for many years to come.

C. Eugene Mills,
assistant State conservationist,
SCS, Amherst, Mass.

Field Workshops for Teachers

by Jerry Howell

Workshops on new developments in individual academic subjects and teaching techniques are one way elementary and secondary school teachers can keep themselves up to date. In an increasingly common type of workshop in conservation edu-

ation, teachers are visiting places where they can observe and participate in learning activities firsthand.

In Kentucky, Morehead State University, the Kentucky Department for Education, the Kentucky Divisions of Forestry and Conservation of the Department for Natural Resources and Environmental Protection, the University of Kentucky Department of Forestry, and USDA's Soil Conservation Service sponsored their second conservation education field workshop for teachers last summer. The 3-day workshop was held at Robinson Forest in Breathitt County, a summer camp for University of Kentucky forestry students.

During the workshop, the teachers toured the SCS plant materials center at Quicksand and observed how plants are tested for use in soil and water conservation. Coming from a leading coal-producing State, class members were particularly interested in plant materials for reclaiming surface-mined land.

Daytime activities included outdoor educational games and exercises suitable for all grade levels and individual sessions on soil, water, and forests.

Evening activities included viewing environmental movies, an SCS slide show on eastern Kentucky wildflow-

ers, and an SCS slide/tape program on the use of outdoor classrooms on school sites.

ers, and an SCS slide/tape program on the use of outdoor classrooms on school sites.

One evening the teachers also participated in a simulation exercise on land use planning, zoning, and the environment. They assumed the roles of local government officials, citizens, developers, and others to get a feeling for different points of view on environmental issues.

On the last day of the workshop, the teachers met to critique the workshop and talk about what was going on in their schools in environmental education. The workshop sponsors handed out conservation education teaching aids and information on where the teachers could get additional help in developing conservation programs at their schools.

To receive academic credit for the course from Morehead State University, the teachers were required to submit an environmental education project soon after the workshop was completed.

Field workshops like this one are being conducted throughout Kentucky.

Dr. Jerry Howell,
head of the Department of Biological and Environmental Sciences,
Morehead State University,
Morehead, Ky.

Using a net, workshop participants collect aquatic life for identification and study.

Photo by Harold Woodward, visual information specialist, SCS, Lexington, Ky.



Double-Duty Farm

by John Akers

The Soil Conservation Service helped the Mercersburg Academy in south-central Pennsylvania make its worn-out farm productive again and develop part of the farm as an environmental study area.

The headmaster of the boarding high school, Walter Burgin, had contacted SCS for help in restoring the academy's 145-acre farm in 1974. That year, the corn crop was so poor that it wasn't even harvested.

The academy was leasing the farm, and it had been poorly managed for many years. The soil nutrients were depleted, and runoff had severely eroded some areas of the farm.

SCS employees at the Chambersburg, Pa., field office developed a conservation plan for the farm which included stripcropping, and some academy students helped lay out the strips.

In consultation with SCS and academy students, the academy administration reevaluated its farm program and in 1975 decided to lease only the land suitable for crops. One condition of the lease for the cropland was that the farm operators must follow the conservation plan. The academy decided to retain the farm's pasture, woodland, and wildlife areas for environmental education.

The approximately 400 academy students now have a choice of taking physical education or participating in the farm environmental education program. In 1980, 50 students learned about woodland management, pasture management, and raising sheep and beef cattle through the program.

Lois Findlay, a graduate from Canton, Ohio, and former student

leader of the farm program, worked on the farm for 4 years. She says she is thrilled at seeing how much the tree seedlings that she had helped plant as a freshman had grown. Findlay helped plant 4 acres of pine seedlings, 1 acre of walnut seedlings, and 48 fruit trees during her stay at the academy.

Douglas Thompson, a junior from Los Angeles, Calif., helps to take care of the livestock, which includes about 15 beef cattle, 18 sheep, and 8 pigs. Thompson says assisting a ewe to give birth to twin lambs was a memorable experience for him.

Neil Carstensen is a teacher at the academy, and he also directs the farm program. Carstensen says he and the students plan to clean out the old fence rows and sell the wood for firewood, renovate the existing bluegrass pasture with orchardgrass, and plant one field with tall fescue for winter grazing.

The farm's beef cattle are sold off and the profits are used for buying fencing, fertilizer, and other farm supplies.

Some of the academy teachers help the students manage the woodland, pasture, and wildlife areas. And some teachers are taking their classes out on the land to expand on the student's studies in biology and other subjects.

With SCS technical assistance, the corn yield on the Mercersburg Academy's farm has increased to about 150 bushels per acre, and academy students are gaining firsthand experience in working a farm and observing the environment.

John Akers,
district conservationist,
SCS, Chambersburg, Pa.

Playgrounds Restored

Through the Coosa Valley Resource Conservation and Development (RC&D) Area measure in Alabama, the Soil Conservation Service has recently helped 11 counties restore school playgrounds. In St. Clair County, the last of the 11 counties to participate in the project, playgrounds were plagued by flooding, erosion, and soggy areas after rains.

SCS worked with the principals of the schools and with the St. Clair Board of Education on restoring the playgrounds. The board of education provided 25 percent of the funding and RC&D provided the rest.

SCS also provided technical assistance in leveling, shaping, seeding, and installing flumes, diversions, grassed waterways, and curbs to control runoff. Some schools required brick barricades to divert water away from play areas and classrooms during rainstorms. In some cases, underground pipes and tile drains were installed to divert runoff underground.

Special play areas were designed for some school sites to confine play equipment like swings to an area with a high water absorption rate. The areas were enclosed with concrete curb and then filled with 3 inches of gravel and 6 inches of pine bark mulch to cushion students' falls and promote water absorption.

"Each of the school's playgrounds can be used as an outdoor classroom," says Rod Goode, SCS district conservationist at Pell City. "This restoration project provides the proper setting for teaching conservation, appreciation for the environment, and the wise use of natural resources."

Adapted from an article by Janice Bickham in the February 21, 1980, edition of the *St. Clair News-Aegis*, Pell City, Ala.

News Briefs

SCS Maps Used to Locate Missing Child

Maps used routinely in the Soil Conservation Service have found a new use in Vermont as an aid for the State police in search and rescue missions. Thanks to Tom Maclay, SCS district conservationist in Montpelier, aerial maps, soil surveys, and infrared photographs were instrumental in locating a missing toddler in a remote, wooded area of Calais. Maclay, a volunteer fireman, was contacted one afternoon in September to assist in the search for the 4-year-old, mentally retarded, and partially deaf boy who had wandered away from home.

Initial attempts to track down the boy by using a dog were thwarted when members of the immediate family converged on the scene and threw off the scent.

In an effort to help State police organize search patterns, Maclay brought in SCS maps with overlays to record locations of search parties and the times areas were covered and to plot other necessary data.

The procedure in locating a missing child of this age is first to head in the direction of least resistance, or downhill. In this case, the soil survey was used to determine the condition of the land and to help set priorities. Steep areas, marshes, and bodies of water were taken into account. Interpretations of field, hardwoods, softwoods, and other terrain helped determine where to send the various teams of searchers. Civilian volunteers were sent to the more easily accessible sites while those with search operation training covered the more difficult terrain.

In the afternoon of the following day, the child was found, unharmed, in a marsh obscured by swampgrass.

The maps were kept as part of the case file, and the Vermont State police expressed their appreciation for the help provided. Maclay has since been designated SCS's representative with the police to set up procedures and provide a list of SCS personnel who can be contacted in the future. As Maclay put it, "SCS has a lot to offer in search missions, providing not only interpretive maps, but also our personal knowledge and experience of the area and terrain."

Ann Dudas,
public information officer,
SCS, Burlington, Vt.

Hanging on for Wildlife

The Soil Conservation Service announces the release of 'Cling-Red' Amur honeysuckle by the Elsberry Plant Materials Center, Elsberry, Mo., after many years of testing.

Many songbirds and game birds will survive this winter because of Cling-Red Amur honeysuckle. Cling-Red was released because it will provide food and cover for wildlife during the critical winter period when both are in short supply. In addition to improving wildlife habitat, this shrub can be used in field and farmstead windbreaks, roadside beautification plantings, living snowfence plantings, and as a screen or border planting in recreational developments.

Amur honeysuckle is not a native plant of the United States, being introduced into this country about 1830. The parent plants of the Cling-Red release were obtained from the Rochester, N.Y., Bureau of Parks.

Cling-Red is a large shrub growing to a height of 12 to 15 feet with a spread of 16 to 18 feet. The branches spread and droop more than most honeysuckles, resulting in a vase

shape. Cling-Red has conspicuous fragrant white flowers which appear in mid-April. The fruit develops slowly and matures in mid-September to early October as compared to the early summer fruit maturity of tatarian and white-belle honeysuckles. This shrub produces an abundance of bright red berries one-fourth inch in diameter which are retained through most of the winter. The name 'Cling-Red' was selected for the persistence of fruits on the plants which provide food for wildlife at a very crucial time of the year when the food supply is critical.

Field plantings of Cling-Red Amur honeysuckle have performed well in plant hardiness zones 3b, 4, 5, 6, and 7b. These zones represent the States of Iowa, Illinois, Missouri, northwestern Texas, Kansas, New Jersey, Nebraska, North Dakota, Oklahoma, Indiana, and southern portions of Michigan and Wisconsin.

Cling-Red honeysuckle performs best on a deep, well-drained, fertile soil, but grows well on a variety of soils. It can tolerate somewhat poorly drained soils. Performance of Cling-Red has been good when planted in slightly acid soils with a sandy, loamy, or moderately clayey texture. This plant is shade tolerant, aggressive, and competes well with other vegetation.

Cling-Red has been released as an open-pollinated, seed-propagated cultivar. Propagation by commercial nurseries will be from open-pollinated seed. Cling-Red will be commercially available in 1 to 3 years.

Breeder seed is maintained by the Soil Conservation Service Plant Materials Center at Elsberry, Mo.

Jimmy Henry,
manager, Elsberry Plant Materials Center, SCS,
Elsberry, Mo.

Taking Conservation to the Grave

Gullies that once threatened a 115-year-old cemetery outside Rosston, Tex., have been laid to rest thanks to a conservation program.

Fingers of gullies were reaching out from the main channel of Clear Creek and were heading toward the cemetery. "A few years ago we wanted to enlarge our old cemetery," said George Berry, a director of the Clear Creek Watershed Authority, "but first we had to fill in the gullies on the land next to it." Enlarging the cemetery eliminated some of the gullies, but 6 acres of excessively eroded land remained next to the cemetery on what is now the David Brown farm.

Under the Watershed Critical Area Treatment (CAT) Program, Brown signed a project agreement with the Soil Conservation Service to solve the gully problem. With cost-share and technical assistance, Brown constructed a grade stabilization structure at the lower end of the gullies, shaped the gullies, and planted a permanent cover of coastal bermudagrass. He also will install a diversion terrace to divert water into the structure.

Not only has the gully stabilization project beautified the area, but it also will improve the water quality in Clear

Creek, which is a tributary flowing into the Garza-Little Elm Reservoir, one of the water supplies for the Denton and Dallas areas.

The project will benefit wildlife, too. Brush and trees left around the project area will provide food and cover, and the grade stabilization structure will provide a limited water supply.

When the coastal bermudagrass is established, Brown will have additional forage for his livestock.

Other benefits to this rural American community are difficult to measure, such as the historical, archaeological, sentimental, and ecological gains.

The CAT Program has been well received by the landowners near Rosston and along the banks of Clear Creek. In fact, it has generated a renewed interest in conservation. To date, 30 CAT projects have been developed in the watershed obligating more than \$216,000 in cost-share funds.

Ray J. Svacina,
district conservationist,
SCS, Gainesville, Tex.

Heavy Rains Convince Farmer That No-Till Is the Way to Go

A Darke County, Ohio, grain and livestock farmer is convinced that no-till is the way to go. Art Brandt and his

son Jim planted about 500 acres in beans, 300 acres in corn, and 100 acres in wheat last summer—nearly 400 acres was in conservation tillage or "no-till."

At the end of last summer's frequent, heavy rains, Darke County got another 6 inches of rain in 6 hours. Rainfall in the area where the Brandt farm is located measured 9½ inches in 10 hours—2 inches of this came in only 30 minutes.

Yet, the no-till acreage on the Brandt farm had no noticeable erosion. "Our conventionally tilled cropland didn't do as well," said Art.

Conventionally tilled cropland on nearby farms also eroded severely. Some of the gullies were so deep that farm equipment couldn't get across them, and the farmers had to get bulldozers to fill in the gullies.

Art Brandt has been farming for 47 years. In recent years, he has been increasing his no-till acreage, but this year made the difference.

"From now on," says Jim, "all of our cropland will be in no-till."

Art has been a Darke County Soil and Water Conservation District supervisor for 20 years. He is immediate past president of the Ohio Federation of Soil and Water Conservation Districts and served 10 years on the National Association of Conservation Districts Agricultural Research Committee.

Robert K. Kissler,
public information officer,
SCS, Columbus, Ohio

Mississippi Zoning Ordinances Protect Prime Farmland

In 1958, DeSoto County was one of the first counties in Mississippi to set up a planning commission and adopt zoning ordinances to restrict conver-



sion of agricultural land for large-lot residential developments and most types of commercial and industrial development.

The commission used a comprehensive land use plan and information from the soil surveys prepared by the Soil Conservation Service and the Mississippi Agricultural and Forestry Experiment Station as part of the technical assistance to the DeSoto County Soil and Water Conservation District (SWCD).

In 1968, the plan was updated and zoning ordinances made more restrictive. Through the years, land use changes have had to be approved by the commission. The commission recently turned down an application to convert 40 acres of farmland to industrial use. But Memphis, Tenn., continues to grow across the county line, and pressures are mounting to convert more agricultural land, including portions of the Mississippi River Delta, some of the richest farmland in the world.

Fred Rogers, commission planner, says only rarely has the commission approved requests to convert prime farmland in the western 20 percent of the county lying within the Mississippi River Delta. However, he says there will be pressures for housing to accommodate growth, facilities to support residential development, a proposed power plant on the Mississippi River, a proposed coal gasification plant, and industries to boost economy and strengthen the county's tax base.

The commission is now updating the 1968 County Land Use Plan and on March 13, 1980, completed a 3-week series of countywide public meetings to identify issues and public interests. According to Rogers, there were a number of comments about prime farmland preservation. When

the plan is completed, the commission will take it back to the people for further comments, and will then present it to municipal and county government officials for final approval.

According to a 1976 survey by *Sales and Marketing Management* magazine, DeSoto County was then the 10th fastest growing county in the Nation. About one-quarter of the county is now urbanized.

DeSoto County SWCD commissioners became interested in protecting farmland more than 20 years ago. They promoted establishment of the commission and passage of zoning ordinances. According to M. C. Sparks, Jr., a farmer, SWCD commissioner, and a past president of the commission, "The SWCD was, and still is, very much interested in strengthening zoning ordinances to protect prime farmland.

"We have speculators coming into the county ready to buy up land and let it sit there, neglected and deteriorating, to the detriment of the county as a whole as well as the farming community. We feel that agriculture is the highest and best use for much of the land in this county, and our primary objective is to preserve it, not only for continued production of food and fiber but also for the good environment and good quality of life that we all want so much. We need to be aware of all these factors and not let our farms be eroded, broken up, and destroyed."

Rose C. Fleming,
former public information officer,
SCS, Jackson, Miss., now retired

400,000 deaths occur before the victim reaches the hospital. However, many of these deaths could have been prevented if prompt and appropriate action were taken.

Cardiopulmonary resuscitation (CPR) is a technique that can be learned by anyone and can be used to maintain life until advanced life support is available. It involves a combination of mouth-to-mouth breathing, or other breathing techniques, and chest compression. This procedure keeps oxygenated blood flowing to the brain until appropriate medical treatment can restore normal heart action.

CPR training and certification is provided nationally through the American Heart Association and the American Red Cross. Many Soil Conservation Service State programs, in New Mexico and Kentucky, for example, have already conducted this type of training, and it remains part of their annual training programs.

SCS management highly recommends that a sufficient number of employees in each State be trained so that one or more SCS employees can respond promptly to an emergency situation. It is in the interest of the well being of you, your family members, associates, friends, and coworkers that you take advantage of this training. You never know when this vital need may arise and you may be the only one available to save the life of a heart attack victim.

In early 1981, SCS will issue a policy which will encourage the establishment and promotion of CPR training programs for SCS employees.

Jim Engleka,
safety manager, SCS, Washington, D.C.

CPR Saves Lives

Each year, heart attacks claim approximately 700,000 lives in this country. Of this number, nearly

Management Tips

Readers are invited to submit "Management Tips" to the editor, *Soil and Water Conservation News*, Soil Conservation Service, P.O. Box 2890, Washington, D.C. 20013.

Doing a Community Agricultural Inventory

by Raymond Lobdell

The preservation of agricultural land is one of the most talked about land use issues in New Hampshire and the Nation. Government at all levels has been working on policies, regulations, and laws that deal with the issues of losing agricultural land to other uses. As I see it, the one common thread throughout these discussions is the belief that local communities have to take the lead in establishing their own goals and policies regarding agricultural land. By putting together an agricultural inventory for your town, you can help insure that any decisions made concerning agricultural land will be informed decisions.

But what is an agricultural inventory? Well, it's an assessment of agriculture in your town. Not just agricultural land, but farms, farmers, agribusiness, etc. It's an evaluation of the total agricultural environment. Among the considerations should be:

- Land Capability—The first step is to determine what land is capable of supporting agriculture and where in town it is located. Soils maps can provide this information and your local conservation district can break down the agricultural soils into groups based on productivity and capability for producing crops.
- Land Use—Land capability indicates the potential for agricultural use but does not tell how the land is currently being utilized. A map showing cropland, hay fields, pastures, orchards, etc., should be developed.
- Farm Survey—Identify the number and types of farms in your town, how many people are employed, what crops are raised, etc. Don't forget the part-time farmer. Your county agricultural agent can help a great deal.
- Economics—Determine what farmers in your community buy and where. How many businesses depend on agriculture for their existence?
- Land Ownership Patterns—Find out who owns the farmland and if it is being subdivided. How much of the

agricultural land is owned by nonresidents? Do farmers depend on leasing land in order to survive?

- Tax Structure—Establish the percentage of agricultural land that is in current use and evaluate how effective it is in protecting agricultural land. What has been the impact on the town's tax base?

These are but a few of the areas your committee can evaluate. Agricultural preservation is not an easy land use issue to resolve, but if towns take the time to collect and analyze the facts surrounding the issue, your community will be in a much better position to make sound judgments about its future.

Raymond Lobdell,
community planning coordinator,
North Country Council,
Grafton, N.H.

Reprinted from the Grafton County Conservation District News and Views.

RCA Update

by Tom Levermann

With the recent release and distribution of the 223-page *Report of the Public's Comments on the RCA Draft Documents, January–March 1980*, along with a concise four-page brochure summarizing the public's comments, another phase of the 1980 Soil and Water Resources Conservation Act (RCA) process has been completed.

The report provided an in-depth analysis of the comments received from the more than 118,000 citizens,

organizations, and agencies responding to the first set of RCA draft documents. The release of the report and summary has rekindled public interest in RCA, particularly on what will be happening in the forthcoming months.

The interagency RCA Coordinating Committee has decided to prepare a new document, entitled *Revised Program Report and Environmental Impact Statement (EIS)*, which will contain USDA's proposed soil and water conservation programs, objectives, and activities. Additionally, a 16- to 20-page detailed summary of the Program Report will be prepared. These documents will be available for public review and comment during a

public review period early in 1981.

The Coordinating Committee recently approved various objectives which will be met by USDA's soil and water conservation program. The objectives were aimed at the following major natural resource areas: soil quality and quantity, water quality, water conservation and supply, fish and wildlife habitat, upstream flood damages, energy conservation and production, and organic resources and urban development.

Establishing conservation objectives to meet various environmental, social, and economic needs was the first major step in developing a nationwide soil and water conservation program. An integral part of this

Stormwater Runoff Management Ordinance Available

A model Stormwater Runoff Management Ordinance has been drafted by the Mid-America Regional Council in cooperation with the Mid-America Association of Conservation Districts. Both organizations serve eight Kansas and Missouri counties around Kansas City.

Work on the ordinance followed destructive floods in Kansas City and Independence, Mo., on September 12, 1977. The 500-year frequency storm left 3,000 homeless and cost the lives of more than a score of people.

The model ordinance would require persons proposing to develop land to submit for approval stormwater runoff management plans detailing how runoff will be controlled. Drainage permits would have to be obtained prior to undertaking "development," which is broadly defined as any change of land use or any improvement.

is the role each USDA agency will play in the Department's future soil and water conservation efforts.

For each resource area, there will be three optional conservation programs which could be implemented as part of the Department's soil and water conservation program.

Both the report and the summary will be available for public review from the following USDA agencies associated with RCA: Agricultural Stabilization and Conservation Service; Economics and Statistics Service; Farmers Home Administration; Forest Service; Rural Electrification Administration; Science and Education Administration; and Soil Conservation Service.

The ordinance also calls for individual management controls and practices, including detention basins; rooftop or parking lot storage; open channels; drainage swales; streets, curbs, and gutters; and enclosed conveyance systems to manage runoff. Each private developer would be responsible for managing stormwater runoff on his or her property to insure adequate drainage and control during and after construction.

Any of the 114 local governments in the eight-county area would, if it adopted the ordinance, develop master drainage plans, collaborating with neighboring towns or cities on plans for basins which overlap boundaries. Individual stormwater management plans could be coordinated with master drainage plans.

Single copies of the model ordinance are available from Robert J. Brejcha, Soil Conservation Service, Federal Bldg., Room 225, 301 West Lexington, Independence, Mo. 64050.

Farm Cooperatives Have Separate USDA Agency

Farm cooperative activities within the U.S. Department of Agriculture will be centered in the Agricultural Cooperative Service, a newly established USDA agency.

The new agency began operating as a separate unit October 1, 1980. The functions of the agency had been handled by USDA's Economics, Statistics, and Cooperatives Service (ESCS). The Agricultural Cooperative Service was known as the Farmer Cooperative Service before being incorporated into ESCS in 1977.

Secretary of Agriculture Bob Bergland said farmer cooperatives have enabled their members to be more competitive in the marketplace and that it is USDA policy to offer maximum encouragement and support to family farmers and their cooperatives. The Economics, Statistics, and Cooperatives Service will now be called the Economics and Statistics Service.

USDA will print 35,000 copies of the Revised Program Report/EIS and 750,000 copies of the summary. All individuals, organizations, and agencies responding to RCA during the first public review period, or who attended one of the 18 regional meetings (January–March 1980), will automatically receive copies of the summary. The Revised Program Report/EIS will be sent to State government officials, national organizations, and Federal agencies. Others requesting copies of the Program Report or summary will receive them while the supply lasts.

An exact schedule has not been set for the 60-day public review period. USDA is not planning to hold field

RCA meetings during the review period.

To assist the public responding to RCA and to provide the Coordinating Committee with the public's attitudes about the conservation proposals, USDA is proposing to include a response form in the summary document. Although the use of the form by the public is strictly voluntary, it would focus public comments to those specific items the Coordinating Committee considers as critical in developing and implementing USDA's soil and water conservation program.

Tom Levermann,
member, RCA Public Participation Team,
SCS, Washington, D.C.

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Meetings

January	11-15	American Farm Bureau Federation, New Orleans, La.
	12-15	North American Gamebird Association, Springfield, Ill.
	15-16	National Council of Farmer Cooperatives, Hollywood, Fla.
	18-19	Land and Water Exposition, Des Moines, Iowa
	25-28	National Wool Growers Association, San Antonio, Tex.
February	1-4	Land Improvement Contractors of America, San Antonio, Tex.
	1-5	National Association of Conservation Districts, San Francisco, Calif.
	9-11	Southern Forest Institute, Inc., New Orleans, La.
	9-13	Society for Range Management, Tulsa, Okla.
	13-16	American Association of School Administrators, Atlanta, Ga.
	15-18	Agri-Turf Irrigation Exposition and Technical Conference, Salt Lake City, Utah
	22-27	American Society of Photogrammetry and American Congress on Surveying and Mapping, Washington, D.C.
March	21-25	North American Wildlife and Natural Resources Conference, Washington, D.C.
	27-29	National Wildlife Federation, Norfolk, Va.
	29-31	American Pulpwood Association, Atlanta, Ga.

New Publications

Livestock Grazing Management and Water Quality Protection

by the U.S. Environmental Protection Agency and the U.S. Department of the Interior, Bureau of Land Management

This report is a state-of-the-art reference of methods, procedures, and practices for including water quality considerations in livestock grazing management activities. It discusses the effects of grazing and rangeland treatment on runoff and water quality. The report contains a comprehensive bibliography and an appendix on rangeland treatments.

Copies are available from the Water Division, U.S. Environmental Protection Agency, 1200 Sixth Avenue, Seattle, Wash. 98101.

Understanding the Game of the Environment

by the U.S. Department of Agriculture, Forest Service

This bulletin is an illustrated guide to ecology for high school students, youth organizations, and groups interested in ecology. It is a summary of major ecological principles and concepts viewed as a game. The depletion of land counts as a foul in this game. The color illustrations are detailed and complex.

The publication is available for \$6.50 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (Stock No. 001-001-00498-7.)

Total Irrigation—Show and Tell

by the Irrigation Association

This publication is the proceedings of the annual Irrigation Technical Conference held at Houston, Tex., in February 1980. It includes an update on the

Federal land treatment program. Copies are available for \$12 from The Irrigation Association, 13975 Connecticut Avenue, Silver Spring, Md. 20906.

Toxic Substances in the Great Lakes

by the U.S. Environmental Protection Agency

This publication has a chart of the toxic substances that most threaten the Great Lakes environment. For each toxic substance, the chart lists its use, probable source, location, characteristics, and health effects. The publication also has a map locating these substances in the Great Lakes. It discusses how toxins affect the Great Lakes and what is being done to protect the Great Lakes.

Copies are available from the Office of Public Information, U.S. Environmental Protection Agency, 230 South Dearborn Street, Chicago, Ill. 60604.

Recent Soil Surveys Published

by the Soil Conservation Service

Arizona: San Simon Area.

California: Riverside County (Coachella Valley Area).

Kansas: Marshall County.

Louisiana: Allen Parish.

North Dakota: Emmons County.

Oregon: Malheur County.

Texas: Clay County.

Washington: Kitsap County Area.

Wisconsin: Adams County.